

What is claimed are:

1. A method of forming a dual damascene pattern in a semiconductor device, comprising the steps of:

providing a semiconductor substrate in which an interlayer insulating film is formed and a trench of a given pattern is formed in the interlayer insulating film;

forming a photoresist pattern in which a via hole region is defined, in the trench;

forming a high polymer solution coating film containing a crosslinkable agent or a radical generator, on the entire structure;

reacting to the crosslinkable agent or the radical generator with polymer of the photoresist pattern by means of a baking process so that an etching tolerance property is increased, thereby forming a hardened photoresist pattern;

removing the high polymer solution coating film; and

forming a via hole in the interlayer insulating film by an etching process, wherein the photoresist pattern is thinly formed relatively as much as the etching tolerance property is increased by the hardened photoresist pattern.

2. The method as claimed in claim 1, wherein the crosslinkable agent is multi-functional ether or multi-functional alkyl halo compound.

3. The method as claimed in claim 2, wherein the multi-functional ether is methyl ether or ethyl ether.

4. The method as claimed in claim 2, wherein the multi-functional alkyl halo compound is alkyl chloro compound, alkyl bromo compound or alkyl iodo compound.

5 5. The method as claimed in claim 1, wherein the radical generator is a thermal radical generator or its inducer.

6. The method as claimed in claim 1, wherein the high polymer solution coating film is formed using aqueous high polymer solution and uses
10 de-ionized water as a solvent.

7. The method as claimed in claim 1, wherein the baking process is implemented in an oven or hot plate heating mode and is performed at a temperature of 50 ~ 250 °C .